AMENDMENTS TO CLAIMS

Claims 1-17 (cancelled).

Claim 18. (previously amended) A tumbling apparatus for the tumbling processing of large amounts of individual, irregularly shaped raw materials including rock and stone having non-uniform, different overall individual sizes into a finished, tumbled condition and for discharging the finished, tumbled product in separated condition sorted into groups of different, predetermined product size range, the tumbling apparatus comprising:

a) a longitudinally extending base frame having opposite front and rear longitudinal ends and configured for disposition on an underlying surface,

b) a substantially hollow tumbling drum supported on said base frame for rotation thereon, said tumbling drum having a peripheral side wall, a closed, front, first longitudinal end and an opposite second rear longitudinal end defining therebetween an interior drum tumbling cavity, said second, rear longitudinal end having a central opening for loading passage of raw material therethrough and into said drum cavity during rotation of the drum and for discharge passage of tumbled material product therethrough and out of said drum cavity during rotation of said drum,

c) a substantially cylindrical, longitudinally extending first sizing ring member having a hollow interior therethrough and open at both opposite longitudinal ends, the ring

member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end of the tumbling drum and encircling said central opening for communication of the hollow interior of the ring member with the central opening, the ring member formed with a plurality of tumbled product sizing openings each having a first, predetermined diameter,

d) a substantially cylindrical, longitudinally extending, second sizing ring member having a hollow interior therethrough and open at both opposite longitudinal ends, the ring member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end and encircling said central opening for communication of the hollow interior of the ring member with the central opening, said second sizing ring member formed with a plurality of tumbled product sizing openings each having a second, predetermined diameter greater than said first predetermined diameter of said sizing openings of said first ring member,

e) power drive means for rotating said tumbling drum supported on said base frame,

f) a feed conveyor having infeed and outfeed ends, the feed conveyor supported on the base frame for longitudinally forward movement of the outfeed end of the conveyor into registry with the interior of said longitudinally rearwardly extending hollow ring members and said central opening of the drum for conveying raw material therethrough and into the

drum cavity during rotation of said tumbling drum, and for reverse longitudinal movement of the outfeed end out of registry with the interior of the hollow ring members for discharge of tumbled material from the tumbling apparatus, and

g) tumbling drum tilt means for longitudinally tilting the tumbling drum during rotation on the base frame between a first, loading and tumbling position in which the rotating drum is tilted so that material tumbling in the drum cavity cannot move out of the drum cavity through said drum opening during rotation of the tumbling drum, and a second, discharge position in which the rotating tumbling drum is tilted so that material in the tumbling drum cavity moves toward and through said drum opening and the hollow interior of said first and second sizing ring members during rotation of the tumbling drum,

h) whereby, with the drum rotating and in said second, tilted discharge position and tumbled material moving rearwardly out of the interior of the drum through said central opening and the hollow interior of the encircling first and second sizing ring members extending rearwardly from the drum, said ring members are arranged for material having a diameter less than the diameter of the tumbled product sizing openings of the first sizing ring member to freely pass therethrough and fall vertically downwardly by gravity to a first, smallest finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the first ring member but smaller than the larger diameter of the sizing openings of the second sizing ring member to fall by gravity to a second, intermediate

finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the second sizing ring member to move rearwardly through the hollow cylindrical second sizing ring member and out of the open longitudinal end thereof to a third, largest finish product size discharge sort location.

Claim 19. (cancelled).

Claim 20. (cancelled) .

Claim 21. (previously amended) The tumbling apparatus of claim 18 including a feed hopper supported on the base frame for communication with the infeed end of said feed conveyor, said feed hopper for containing a supply of raw material to be conveyed into the interior of the drum by the feed conveyor.

Claim 22. (previously added) The tumbling apparatus of claim 21 wherein said base frame is configured as a mobile transport vehicle having ground-engaging wheels for supporting the vehicle for transport along underlying road surfaces.

Claim 23. (previously added) The tumbling apparatus of claim 18 wherein said base frame is configured as a mobile transport vehicle having ground-engaging wheels for supporting the vehicle for transport along underlying road surfaces.

Claim 24. (cancelled).

Claim 25. (previously added) A tumbling apparatus for the tumbling processing of large amounts of individual, irregularly shaped raw materials including rock and stone having

non-uniform, different overall individual sizes into a finished, tumbled condition and for discharging the finished, tumbled product in separated condition sorted into groups of different, predetermined product size range, the tumbling apparatus comprising:

a) a base frame configured for disposition on an underlying surface,

b) a substantially hollow tumbling drum supported on said base frame for rotation thereon, said tumbling drum having a peripheral side wall, a closed, front, first longitudinal end and an opposite second rear longitudinal end defining therebetween an interior drum tumbling cavity, said second, rear longitudinal end having a central opening for loading passage of raw material therethrough and into said drum cavity during rotation of the drum and for discharge passage of tumbled material product therethrough and out of said drum cavity during rotation of said drum,

c) a substantially cylindrical, longitudinally extending first sizing ring member having a hollow interior therethrough and open at both opposite longitudinal ends, the ring member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end of the tumbling drum and encircling said central opening for communication of the hollow interior of the ring member with the central opening, the ring member formed with a plurality of tumbled product sizing openings each having a first, predetermined diameter,

d) a substantially cylindrical, longitudinally extending, second sizing ring member

having a hollow interior therethrough and open at both opposite longitudinal ends, the ring member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end and encircling said central opening for communication of the hollow interior of the ring member with the central opening, said second sizing ring member formed with a plurality of tumbled product sizing openings each having a second, predetermined diameter greater than said first predetermined diameter of said sizing openings of said first ring member, said first longitudinally elongated cylindrical sizing ring member having predetermined longitudinal length, overall ring diameter, and sizing opening diameter dimensions, and said second, longitudinally elongated cylindrical sizing ring member having a predetermined second length that is greater than said predetermined length of said first ring member and has a predetermined overall ring diameter that is less than the predetermined overall ring diameter of said first ring member, and said first ring member is supported on said tumbling drum in condition encircling said second ring member rearwardly adjacent said second, rear longitudinal end of the tumbling drum,

e) power drive means for rotating said tumbling drum supported on said base frame,

f) loading means for communicating raw material to be tumbled in a first direction through said first and second ring members and said drum opening into said drum cavity during rotation of said tumbling drum on said base frame, and

g) tumbling drum tilt means for longitudinally tilting the tumbling drum during rotation on the base frame between a first, loading and tumbling position in which the rotating drum is tilted so that material tumbling in the drum cavity cannot move out of the drum cavity through said drum opening during rotation of the tumbling drum, and a second, discharge position in which the rotating tumbling drum is tilted so that material in the tumbling drum cavity moves toward and through said drum opening and the hollow interior of said first and second sizing ring members during rotation of the tumbling drum,

h) whereby, with the drum rotating and in said second, tilted discharge position and tumbled material moving rearwardly out of the interior of the drum through said central opening and the hollow interior of the encircling first and second sizing ring members extending rearwardly from the drum, said ring members are arranged for material having a diameter less than the diameter of the tumbled product sizing openings of the first sizing ring member to freely pass therethrough and fall vertically downwardly by gravity to a first, smallest finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the first ring member but smaller than the larger diameter of the sizing openings of the second sizing ring member to fall by gravity to a second, intermediate finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the second sizing ring member to move rearwardly through the hollow cylindrical second sizing ring member and out of the open longitudinal end thereof to a

third, largest finish product size discharge sort location.

Claim 26 (previously added) A tumbling apparatus for the tumbling processing of large amounts of individual, irregularly shaped raw materials including rock and stone having non-uniform, different overall individual sizes into a finished, tumbled condition and for discharging the finished, tumbled product in separated condition sorted into groups of different, predetermined product size range, the tumbling apparatus comprising:

a) a base frame configured for disposition on an underlying surface,

b) a substantially hollow tumbling drum supported on said base frame for rotation thereon, said tumbling drum having a peripheral side wall, a closed, front, first longitudinal end and an opposite second rear longitudinal end defining therebetween an interior drum tumbling cavity, said second, rear longitudinal end having a central opening for loading passage of raw material therethrough and into said drum cavity during rotation of the drum and for discharge passage of tumbled material product therethrough and out of said drum cavity during rotation of said drum, said second, rear end of said tumbling drum including a radially inwardly projecting end wall member encircling said central opening for preventing free passage of at least a portion of liquids, abrasive fines, and undesirably small waste product from discharging through said central opening and for retaining the materials in the interior cavity of the tumbling drum for subsequent tumbling operations of the apparatus,

c) a substantially cylindrical, longitudinally extending first sizing ring member

having a hollow interior therethrough and open at both opposite longitudinal ends, the ring member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end of the tumbling drum and encircling said central opening for communication of the hollow interior of the ring member with the central opening, the ring member formed with a plurality of tumbled product sizing openings each having a first, predetermined diameter,

d) a substantially cylindrical, longitudinally extending, second sizing ring member having a hollow interior therethrough and open at both opposite longitudinal ends, the ring member supported on the tumbling drum in position extending longitudinally rearwardly of said second, rear end and encircling said central opening for communication of the hollow interior of the ring member with the central opening, said second sizing ring member formed with a plurality of tumbled product sizing openings each having a second, predetermined diameter greater than said first predetermined diameter of said sizing openings of said first ring member,

e) power drive means for rotating said tumbling drum supported on said base frame,

f) loading means for communicating raw material to be tumbled in a first direction through said first and second ring members and said drum opening into said drum cavity during rotation of said tumbling drum on said base frame, and

g) tumbling drum tilt means for longitudinally tilting the tumbling drum during rotation on the base frame between a first, loading and tumbling position in which the rotating drum is tilted so that material tumbling in the drum cavity cannot move out of the drum cavity through said drum opening during rotation of the tumbling drum, and a second, discharge position in which the rotating tumbling drum is tilted so that material in the tumbling drum cavity moves toward and through said drum opening and the hollow interior of said first and second sizing ring members during rotation of the tumbling drum,

h) whereby, with the drum rotating and in said second, tilted discharge position and tumbled material moving rearwardly out of the interior of the drum through said central opening and the hollow interior of the encircling first and second sizing ring members extending rearwardly from the drum, said ring members are arranged for material having a diameter less than the diameter of the tumbled product sizing openings of the first sizing ring member to freely pass therethrough and fall vertically downwardly by gravity to a first, smallest finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the first ring member but smaller than the larger diameter of the sizing openings of the second sizing ring member to fall by gravity to a second, intermediate finish product size discharge sort location, and material having a size greater than the diameter of the sizing openings of the second sizing ring member to move rearwardly through the hollow cylindrical second sizing ring member and out of the open longitudinal end thereof to a third, largest finish product size discharge sort location.